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HOUSE COMMITTEE ON ENERGY AND COMMERCE
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THE RENEWABLE FUELS STANDARD: ISSUES IMPLEMENTATION AND
OPPORTUNITIES

SUBCOMMITTEE HEARING

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Testimony of Randy Kramer, President

KL Process Design Group

Rapid City, South Dakota

www.klprocess.com

Testimony Outline:

Background: KL's Cellulose-Based Ethanol Technology and Operating Plant

Importance of All Forms of Bio-fuels Technology

Redefining United States Motor Fuels Refining Capacity

Defining the new "Glucose Economy"

Correcting RFS Cellulosic Credit Language Regarding our National Forests

Addressing other Bill Provisions: Mandated Studies on E85 Efficiency Improvements
and Ethanol Pipeline Transport

Mr. Chairman, Ranking Members, Members of the Committee, thank you for the opportunity to provide testimony on the implementation of the 2007 Renewable Fuel Standard. I am Randy Kramer, President and co-founder of KL Process Design Group (KL), a biofuels engineering and project development firm located in Rapid City, South Dakota. Our co-founder, Dave Litzen is also here with me today. Since 2001, KL has collaborated with researchers at the South Dakota School of Mines and Technology to develop a thermal-mechanical process to make ethanol from ponderosa pine which is found in abundance in the Black Hills. The research resulted in what we believe to be the first wood waste ethanol demonstration plant capable of commercial operations. With the Black Hills National Forest Supervisor our research is dedicated to forest stewardship that includes finding better uses for gathered forest and mill waste that otherwise provides added fuel to forest fires.

KL is uniquely qualified to discuss the implications and effects of cellulosic ethanol provisions legislated in the 2007 Energy Bill. Beyond our experience in corn and cellulose-based ethanol plant designs, our engineers are veterans of oil exploration and refining and our project managers are veterans of combat operations in oil-rich areas of the world. Conversely, here in the United States, KL's technology has resulted in the construction of ethanol plants where farmers are paid market prices for their corn which offset or eliminate farm subsidies. Our cellulosic technology also helps reduce particulate emissions resulting from controlled and uncontrolled fires in our national forests, costing the federal government millions of dollars to manage.

Corn-based ethanol is the only large volume, biofuels bridge to the 2012 cellulose ethanol goal. We must protect this bridge as a strategic component to allow companies like ours to improve cellulose technology; and we take exception to the misrepresentations being touted by the media, special interest groups and the United Nations who cling to the baseless notion that ethanol is somehow displacing agricultural resources and linking the displacement of corn from food to fuel. According to USDA statistics, in 2007 field corn used to produce ethanol increased by about 1 billion bushels but corn production also increased by 3 billion bushels. Specifically, between March 2007 and March 2008 there was a 13% increase in stored, uncommitted surplus corn—both on and off the farm. Today, in South Dakota, there is still corn on the ground not being used for ethanol or export. We need corn-based ethanol as a bridging strategy, it is not the primary cause for rising food prices or shortages, and it will always be an integral part of our energy policy even as cellulose and other technologies advance. Incentives for both corn and cellulose based ethanol should be maintained just as incentives for oil discovery were put in place and maintained since 1925. Last week, President Bush stated that the United States has not built a refinery since 1976. KL takes a different approach. In the bio-fuels vernacular there were, in fact, 84 new bio-refineries built over the last ten years that have effectively replaced the need for approximately eight new averaged-size oil refineries. This assumes 115,000 barrels per day of crude feed with 50% of the crude converted to gasoline. The difference is crude oil will only be extracted once where bio-refining feedstocks replenish every year. This new RFS is the only responsible energy plan that requires even more bio-refineries by 2012. As cellulose-based ethanol technology improves, our business model departs from the current paradigm of large grain-based ethanol plants in the Midwest. While grain-based plants are an important part of the future bio-refining

strategy, cellulosic ethanol plants will be smaller and decentralized throughout the US; co-locating with or close to biomass sources that are immune to the geo-agricultural constraints needed for grain based ethanol production, thereby eliminating or reducing the cost of transporting biomass material and in close proximity to populated biofuels demand. This design disarms critics who believe ethanol is too far from the end user and makes use of biomass that is either burned or land-filled.

To meet the requirements of the RFS, we know there will be a need to continue improving efficiencies in grain and cellulose based designs to move us quickly to what we call the “glucose economy” where starch or cellulose provide the sugars used to produce chemicals and bio-fuels. The United States possesses the biomass to meet the needs of a glucose economy and is well-documented in the Department of Energy’s own “Billion Ton Study” conducted at the Oak Ridge Laboratory in April 2005. As noted in the study, much of this biomass is located on federal lands to include our national forests. To sustain the momentum of building additional bio-refineries that meets the intent and aggressive mandates of the RFS, administrative rules must allow for all forms of biomass without regard to its source. As we plan to co-locate our second plant with a sawmill in the Black Hills, one specific clause in the 2007 Energy Bill, inserted by special interests after lawmakers reviewed what they thought to be the final language, must be corrected. Specifically, credits intended for cellulosic ethanol produced from biomass harvested from our national forests through federal programs already in existence, must be restored. The intent of this last minute provision was to discourage the harvesting of material from the national forests for bio-fuels production. However, the drafters failed to understand that existing timber harvest and thinning programs already allow for the removal of

material from the national forests. In the case of thinnings, any reasonable person would understand that processing this waste into a clean burning fuel is less destructive to the environment than burning it in place. In the case of commercial timber harvested through these federal programs, mill waste from these operations fit perfectly with our business model but the burden of segregating non-credit qualifying bits of national forest mill waste from private or state timberland mill waste that do qualify is as impractical as it sounds. Imagine the complexity of separating mill waste for the sake of recovering valuable cellulosic ethanol credits. The cost would likely outweigh the credit. We live near a national forest and consider ourselves active stewards of the environment. Our desire is not to clear-cut the forest to produce biofuels but given existing harvest programs, credits from these operations are critical to the near term success of cellulosic ethanol; and the process improvements we make during this development period enable us to keep pace with the 2012 goals.

Whether ethanol comes from corn or cellulose, it is the near term answer as it can fuel most combustion engines today. While 10 and 85 percent blends are standard, we have experience with a variety of blends and it is our conclusion that a blend between 20 and 30 percent would be the near term answer for all gasoline-fueled vehicles. My point is simple. We do not expect ethanol to replace all fossil fuels in America, but compliment them, Like Brazil, most all of our automobiles can operate with at least a 30% blend without modification. The EPA could allow these blends with the stroke of a pen. Related to this discussion, the 2007 Energy Bill calls for a study to improve the efficiency of flex fuel vehicles. As a start point, I would like to offer a recommendation. We know that ethanol burns cleaner and cooler than gasoline. What isn't well known is that ethanol has

the potential to burn more efficiently than gasoline because of its high octane rating. Our experience through test trials with the American Lemans Racing Series and Harley-Davidson motorcycles shows E85 not only burns cooler and cleaner but also provides more horsepower and increased mileage over regular gasoline when burned in high compression, fuel-injected engines. There is no need to commit further federal dollars to a study that would likely result in directing the automobile industry to revive its design of high-compression engines that fell victim when leaded gasoline was banned. Simply put, ethanol is the modern day octane booster but burning ethanol in modern day low-compression engines results in lower gas mileage because the high octane is not used to its advantage and potential. Reverting to this simple engine design change will likely help the automobile industry meet CAFE standards without sacrificing performance. Finally, I also note that the 2007 Energy Bill calls for a study on pipeline transportation of ethanol. In the interest of saving costs and time, we have the results of a successful 1981 study conducted by Williams Pipeline Company and can provide that study to this Committee. This concludes my testimony. Thank you for this opportunity.